

Daria Patrizia Locatelli & Lidia Limonta

Observations on the presence of *Peripsocus alboguttatus* (Dalman), *P. didymus* Rösler, *P. phaeopterus* (Stephens) and *P. subfasciatus* (Rambur) (Psocoptera Peripsocidae) in Val Brembana*

Abstract - In 1999, from June to October in three areas of Val Brembana, fortnightly surveys were carried on to verify the presence of *Peripsocus* species. *P. alboguttatus* and *P. subfasciatus* are more present than *P. didymus* and *P. phaeopterus*. The four species were altogether surveyed only on fir. *P. subfasciatus* was the most abundant species on fir and apple tree.

Key words: *Peripsocus alboguttatus*, *P. didymus*, *P. phaeopterus*, *P. subfasciatus*, apple tree, fir, hazelnut tree, Val Brembana.

Riassunto - Osservazioni sulla presenza di *Peripsocus alboguttatus* (Dalman), *P. didymus* Rösler, *P. phaeopterus* (Stephens) e *P. subfasciatus* (Rambur) (Psocoptera Peripsocidae) in Val Brembana.

Nel 1999 sono state condotte raccolte quindicinali in Val Brembana in tre località da giugno a ottobre per verificare la presenza di specie appartenenti al genere *Peripsocus*. *P. alboguttatus* e *P. subfasciatus* sono risultate maggiormente presenti di *P. didymus* e *P. phaeopterus*. Le quattro specie sono state trovate contemporaneamente solo su abete. *P. subfasciatus* è la specie presente in maggior quantità su abete e melo.

Parole chiave: *Peripsocus alboguttatus*, *P. didymus*, *P. phaeopterus*, *P. subfasciatus*, melo, abete, nocciolo, Val Brembana.

Introduction

Peripsocus Hagen is a genus widely diffused and contains about a hundred described species.

In the check-list of the species of Italian fauna (Schneider & Lienhard, 1994) three species of Peripsocidae belonging to genus *Peripsocus*, precisely *P. alboguttatus* (Dalman) (Ribaga, 1900), *P. phaeopterus* (Stephens) (Ribaga, op. cit.)

Istituto di Entomologia agraria. Università degli Studi di Milano, Via Celoria 2, 20133 Milano, Italia.
e-mail: daria.locatelli@unimi.it; lidia.limonta@unimi.it

Authors equally contributed to this research.

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and *P. milleri* (Tillyard) sub *reductus* Badonnel (Schneider *et al.*, 1988) result to be recorded till 1993. *Peripsocus subfasciatus* (Rambur), was reported in 1993 (Baz, 1993) in Val Seriana (Province of Bergamo). In 1993 specimens of *Peripsocus didymus* Rösler were collected in samples of leaves and branches in woods of broadleaves and conifers in Valmalenco and Val Tartano (province of Sondrio) (Locatelli & Limonta, 1995). These species live on bark and colonize dead or alive branches of conifers and broadleaves. They are present principally at low altitudes. Adults occur in June-July and they are found till October. *P. didymus* e *P. alboguttatus* have two generations a year; *P. phaeopterus* and *P. subfasciatus* have three generations.

Surveying Psocoptera in Val Brembana it was noticed that *P. alboguttatus*, *P. didymus*, *P. phaeopterus* and *P. subfasciatus* were contemporaneously present in various localities and colonised different plants. The presence of the different species in those localities, where they were more abundant, was investigated.

Materials and methods

In 1999 fortnightly collections were carried out from June to October in three localities in Val Brembana: Averara (636 m a.s.l.) on apple (*Malus domestica* Borkh.) and fir [*Picea abies* (L.) Karsten], Cassiglio (602 m a.s.l.) on fir and hazelnut (*Corylus avellana* L.) and Mojo de' Calvi (662 m a.s.l.) on fir. Samplings in Mojo de' Calvi were carried out in a shady environment with high humidity, while in Cassiglio the survey was made in the area surrounding an artificial lake, exposed to sunlight for many hours. Averara is in an intermediate position, firs are concentrated close to a little stream, in the sunlight late in the morning.

The material was collected by shaking branches on a beating tray and stored in 70% alcohol. In laboratory the identification of adults was carried out by microscope previously preparing the findings on slide.

Results

In the three localities the most widespread and more abundant species are *Peripsocus alboguttatus* e *P. subfasciatus* (Tab. 1).

Tab. 1 – Total percentage of adults of *Peripsocus* on the different host trees. In all in the three localities 505 adults of *P. subfasciatus*, 116 of *P. alboguttatus*, 44 of *P. didymus*, 26 of *P. phaeopterus* were collected.

Tab. 1 – Percentuale totale di adulti di *Peripsocus* sulle differenti piante ospite. In tutte le tre località sono stati raccolti 505 adulti di *P. subfasciatus*, 116 di *P. alboguttatus*, 44 di *P. didymus*, 26 di *P. phaeopterus*.

| Tree | <i>Peripsocus</i> | | | |
|-------------------------|---------------------|----------------|--------------------|---------------------|
| | <i>alboguttatus</i> | <i>didymus</i> | <i>phaeopterus</i> | <i>subfasciatus</i> |
| <i>Picea abies</i> | 12.7 | 9.8 | 2.1 | 75.4 |
| <i>Malus domestica</i> | 15.1 | 3.0 | 12.2 | 69.7 |
| <i>Corylus avellana</i> | 55.6 | 11.1 | 11.1 | 22.2 |

Picea abies

The presence of adults of *P. alboguttatus*, *P. didymus*, *P. phaeopterus* and *P. subfasciatus* on fir in the considered areas is reported in table 2.

The four species were found at the same time from the second half of June till the second half of July. The percentage of *P. subfasciatus* is included between 29.2% and 100%, *P. alboguttatus* between 2.5 to 50%, *P. phaeopterus* between 4.2 to 9.1% and *P. didymus* between 2.5 and 22.2%.

Tab. 2 – Presence of *Peripsocus* spp. on fir.
Tab. 2 – Presenza di *Peripsocus* spp. su abete.

| | Fir | | | | | | | |
|--------------------------------|---------|--------|---------|--------|---------|--------|---------|---------|
| | 15-30/6 | 1-15/7 | 15-30/7 | 1-15/8 | 15-30/8 | 1-15/9 | 15-30/9 | 1-15/10 |
| <i>Peripsocus alboguttatus</i> | ●—————● | | | | | | | |
| <i>Peripsocus didymus</i> | ●—————● | | | | | | | |
| <i>Peripsocus phaeopterus</i> | ●—————● | | | | | | | |
| <i>Peripsocus subfasciatus</i> | ●—————● | | | | | | | |

In table 3 the percentage of the catches of the three species for each locality are reported. The most widespread species is *P. subfasciatus*, followed by *P. alboguttatus* at Cassiglio and Averara. At Mojo de' Calvi *P. phaeopterus* is absent and *P. didymus* outnumber *P. alboguttatus*.

Tab. 3 – Percentage of adults of *Peripsocus* on fir in the different localities during the survey.
Tab. 3 – Percentuale di adulti di *Peripsocus* su abete in differenti località durante la ricerca.

| Localities | <i>Peripsocus</i> | | | |
|----------------|---------------------|----------------|--------------------|---------------------|
| | <i>alboguttatus</i> | <i>didymus</i> | <i>phaeopterus</i> | <i>subfasciatus</i> |
| Averara | 10.2 | 9.6 | 2.4 | 78.3 |
| Cassiglio | 22.0 | 3.5 | 3.5 | 71.0 |
| Mojo de' Calvi | 7.0 | 17.0 | 0.0 | 76.0 |

Malus domestica

Adults of *P. phaeopterus* were found on apple tree in percentage between 16.6% and 33.3% at the same time with *alboguttatus* and *subfasciatus*, except in the first half of September and with a percentage of 5.2 in the second half of July with *didymus* and *subfasciatus* in Averara.

Tab. 4 – Presence of *Peripsocus* spp. on apple tree in Averara.
Tab. 4 – Presenza di *Peripsocus* spp. su melo ad Averara.

| | Apple tree | | | | | | | |
|--------------------------------|------------|--------|---------|--------|---------|--------|---------|---------|
| | 15-30/6 | 1-15/7 | 15-30/7 | 1-15/8 | 15-30/8 | 1-15/9 | 15-30/9 | 1-15/10 |
| <i>Peripsocus alboguttatus</i> | ●—————● | | | | | | | |
| <i>Peripsocus didymus</i> | ●—————● | | | | | | | |
| <i>Peripsocus phaeopterus</i> | ●—————● | | | | | | | |
| <i>Peripsocus subfasciatus</i> | ●—————● | | | | | | | |

Corylus avellana

On hazelnut trees few adults were collected. *P. alboguttatus*, *P. didymus* and *P. subfasciatus* were found at the same time in the first half of July, while *P. phaeopterus* was collected in the first half of August (Tab. 5).

Tab. 5 – Presence of *Peripsocus* spp. on hazelnut tree in Cassiglio.

Tab. 5 – Presenza di *Peripsocus* spp. su nocciolo a Cassiglio.

| <i>Peripsocus</i> | Hazelnut tree | | | | | | | |
|---------------------|---------------|--------|---------|--------|---------|--------|---------|---------|
| | 15-30/6 | 1-15/7 | 15-30/7 | 1-15/8 | 15-30/8 | 1-15/9 | 15-30/9 | 1-15/10 |
| <i>alboguttatus</i> | | ●————● | | | | | | |
| <i>didymus</i> | | ●————● | | | | | | |
| <i>phaeopterus</i> | | | | ●————● | | | | |
| <i>subfasciatus</i> | | ●————● | | | | | | |

Conclusions

Peripsocus subfasciatus is the most present and abundant species during the survey period in the considered environments on fir and apple trees. This agrees with the biological characteristic of the species given by Lienhard (1988).

On fir all the four species were found from half June till the end of July. In the following period *P. phaeopterus* was absent on this tree, while adults of *P. didymus* were collected until the 15th October. This species is present especially in the lowlands in low densities and occasionally colonise the subalpine area. *P. alboguttatus* was found in high quantities in Cassiglio, the most exposed to the sun locality.

On apple tree only few adults of *P. didymus* and *P. phaeopterus* were found, this is due to the features of this plant, an old one with sparse foliage placed in a sunny exposure: an environment not suitable for colonisation of these species. In fact young instars were not found, attesting an occasional landing.

Hazelnut tree, even if it hosts different species of Psocoptera, is colonised only in some periods of the year, particularly in July, and the most frequent species is *P. alboguttatus*. It is worth to underline that the surveyed plants were volunteer trees, less appetizing than cultivated ones.

The less abundant and less diffused species was *P. phaeopterus*, in fact it is a species that prefers plain areas.

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